

BOTANY

Chairman: P. A. ORPURT, Manchester College
JOHN F. SCHAFER, Purdue University, was elected chairman for 1965

ABSTRACTS

A New Fungus on the Marine Phanerogram *Thalassia testudinum*. P. A. ORPURT, Manchester College.—The herbaceous flowering plant known as turtle-grass, *Thalassia testudinum* König, distributed in extensive submarine beds throughout the Caribbean and the Gulf of Mexico, occurs along both coasts of Florida and is especially abundant in the Miami area where it forms the dominant vegetational community to depths of 10 meters.

Lindra thalassiae, a new species of scolecosporous pyrenomycete, has been isolated in considerable abundance from necrotic lesions on *Thalassia* leaves. This represents the first isolation of a fungus from this ecologically important primary producer of carbohydrate.

A Multifaceted Approach to Teaching Botany. PHILLIP SPARKS and S. N. POSTLETHWAIT, Purdue University. Many of the current problems in education can be alleviated to some degree by refocusing our attention on the learning process. Two basic ideas must be taken into consideration: (1) Learning requires involvement of the learner at a pace and a time optimal for him. (2) Opportunities should be provided for repetition, concentration, multi-sensory exposure to subject matter, use of a medium appropriate to the nature of the subject matter, an appropriate sequencing of learning events, and interaction with fellow students and instructors. It is possible and practicable to totally restructure a course in such a way as to provide an opportunity for each student to participate in these learning activities without the loss of conventional procedures which contribute to the learning process.

In a four-hour credit course in freshman botany at Purdue University, the restructuring has consisted of three study sessions: one hour of general assembly, scheduled; one hour of small assembly, scheduled; and four hours of independent study, unscheduled.

The general assembly involves all students in the course and is an occasion for all students to meet the senior instructor, to set an intellectual tone for the course, and to enable the students to accomplish many of the experiences which can best be done vicariously and in large groups.

The small assembly corresponds to a conventional recitation section; however, many kinds of activities which can best be accomplished in groups of thirty are done during this session. These may involve discussion of demonstrations by the instructor, quizzes of the conventional type, and identification with an instructor for administrative purposes.

The independent study session is conducted in a laboratory specially designed for this purpose and is kept open from 7:30 AM until 10:30 PM Monday through Friday. The student comes in at his convenience and signs in on arrival on his personal record card. The student places

this card in a numbered slot which assigns him to one of thirty booths, all of which are set up identically with the materials for the week's work. Each booth is equipped with a tape player, appropriate tapes, a microscope, live specimens, 8 mm loop film projector and other materials which are needed for the week's work. The senior instructor, via audio tape, programs the student through a series of learning events. These events may involve collecting data, doing experiments, examining specimens, reading specified material, comparing specimens with diagrams, and other activities considered useful to the learning process.

With this procedure, it has been possible to include every conventional learning experience and at the same time reduce the space required for a four-hour conventional equivalent of 500 students from two laboratories to one laboratory, improve the performance of the students at all levels, reduce the amount of staff required, enhance the personal contact of instructors and students, and to serve more students with existing staff.

A Virus Disease of Corn in Indiana. A. J. ULLSTRUP, Purdue University.—In 1963 a disease of corn was found in the Ohio River bottomlands of Dearborn, Ohio, Switzerland and Jefferson counties. Symptoms were similar to those of a disease reported in 1962 and in 1963 in the river bottomlands of Ohio and Mississippi. The disease has become more widespread and prevalent in 1964.

Early symptoms on corn are characterized by a finely stippled mosaic of light and dark green on the youngest leaves, together with a shortening of the upper internodes so as to impart a "feather-duster" appearance of the plants. With maturation the mosaic disappears and a general chlorosis with some reddish-purple coloration of leaves becomes evident. Ears on diseased plants may range from those that are normal to those that are completely barren. Tillering and excessive development of adventitious buds at the nodes are only rarely seen. Occasionally both aerial and underground roots exhibit abundant secondary branching.

The inciting agent of the mosaic symptom can be mechanically transmitted to healthy corn seedlings. Symptoms appear in corn seedlings about 72 hours after inoculation.

Under field conditions Johnsongrass, crabgrass, barnyard grass and green, yellow and giant foxtail show the mosaic symptom. The inciting agent of this symptom is mechanically transmissible from these wild grasses to corn seedlings. Johnsongrass may act as a perennial host. Marked differences are evident in resistance to the virus among genotypes of corn.

The identity of the virus is unknown. A complex may be involved which includes corn stunt and some other known or unknown virus, the latter component being mechanically transmissible. Or, a single, heretofore undescribed virus may be the inciting agent of the disease.

Zygote Germination in *Astrephomene*. A. E. BROOKS, Indiana University.—Recently methods have been employed to bring about mass zygote germination in the colonial green flagellate *Astrephomene gubernaculifera*. Following gametic union the zygotes are illuminated for at least 24 hours, plated on solid medium, and placed in the dark for a

minimum of six days. The dark matured zygotes are re-plated on fresh medium and placed in the light. 90-95 percent germination is evident within two hours of replating.

The first morphological manifestation of zygote germination is the appearance of a lens shaped hyaline area adjacent to the wall of the otherwise tan granular zygote. The wall in this area becomes thin and begins to bulge giving the zygote an ellipsoidal character. As the protoplast becomes separated from the wall, two flagella become evident. An irregular opening develops in the thin wall, and the protoplast is released, sometimes violently. After a swarming period the biflagellated zygote settles and undergoes a series of rapid bipartitions to form a small colony. The entire process from replating to zygote colony may occur in less than four hours.